REMARKS

Claims 41, 42, 44-48 and 50-59 are pending in the application. Favorable reconsideration of the application, as amended, is respectfully requested.

I. CLAIM AMENDMENTS

Apparatus claims 25-40 and method claims 43 and 49 have been canceled without prejudice or disclaimer. Claims 41, 42, and 44-48 have been amended herein. New claims 51-59 represent method claims respectively corresponding to apparatus claims 30-33, 35-37, 39 and 40, now canceled.

II. REJECTION OF CLAIMS 25-50 UNDER 35 USC §102(b)/103(a)

Claims 25-50 stand rejected under 35 USC §102(b)/103(a) based on Tanaka et al. alone or in combination with Matsumoto et al. Applicant respectfully requests withdrawal of the rejection for at least the following reasons.

Referring to claim 41, as amended, the method of making a long superconductor according to the present invention includes the following steps of:

> (1) Fabrication of a metal substrate (or of a buffer layer on said substrate) having on or close to its surface longitudinally oriented "long" grains, i.e. grains with a high aspect ratio.
>
> (2) Epitaxially growing a superconducting compound on said substrate (or buffer layer), thereby producing longitudinally oriented <u>long</u> grains in the superconducting compound.

Tanaka et al.:

Tanaka et al. disclose a superconductor whose metallic substrate ("phase" in Tanaka) contains longitudinally oriented "long" grains. It does not disclose that these long grains have to be located on or close to the surface of the substrate. Neither does Tanaka et al. disclose that a buffer layer, if provided, must have these long grains at all. Thus, one may say that Tanaka et al. discloses no more than a faint hint towards the first step of the present invention. Tanaka et al. certainly do not disclose that the surface microstructure of the substrate or of the buffer layer underlying the superconductor compound must have a certain structure to result in the invention.

The further method steps described by Tanaka et al. include various ways of putting a superconducting compound onto the metallic substrate, adressing solely the orientation of the grains in the superconducting compound, but nowhere mentioning their aspect ratio, i.e. that these are long grains. It must be assumed that Tanaka et al. were satisfied with controlling the orientation of these grains - they apparently showed no interest in the shape of these grains.

However, the main goal of the present invention, namely the (further) improvement of the superconductor's performance, is only reached with the described long grains in the superconducting compound. Insofar, the present invention goes significantly beyond the device disclosed by Tanaka et al.

To summarize, Tanaka et al. does not disclose or obviate the present invention

- only with hindsight one may read Tanaka et al. as a teaching towards the present invention.

Matsumoto et al.:

Matsumoto et al. disclose a superconductor having a metallic substrate with longitudinally oriented grains; the manufacturing method including heating the substrate

and producing an "oxide crystal layer" of the substrate's metal on the surface, whereby most of the {100} plane of the oxide crystal layer is inclined at most at an angle of not more than 10° to the surface of the metal.

There is no hint or mention that the grains of the metal or the oxide should be "long", i.e. have a high aspect ratio. There is also no hint or mention that the grains on or close to the surface are the significant ones. Thus, the first step of the present invention is not disclosed.

In the following step of Matsumoto et al. a superconductor is formed on the oxide. Nothing is said about grains in this oxide, neither their length nor their aspect ratio is addressed. Grains are not even mentioned in connection with the oxide. Thus, Matsumoto et al. also does not disclose the second step of the present invention.

Accordingly, Matsumoto et al., being totally silent about the length of the grains or their aspect ratio or their location cannot disclose the present invention.

To summarize, of the two steps noted above that characterize the present invention, none is clearly addressed in the cited art discussed herein. Though the existence or requirement to have long grains in the substrate is addressed in one of the prior art documents, there is no mention that these long grains have to be at the surface of the substrate or, if a buffer layer is provided, that they have to be a the surface of the buffer layer. And the fact that there have to be long grains in the superconductor to provide its improved performance is nowhere addressed in the cited prior art documents.

Claim 41 has been amended and now clearly specifies - in brief - a method for making a long superconductor, e.g. a tape or wire, by depositing at least one polycrystalline superconducting compound onto a metallic substrate or onto a buffer layer system on said substrate, characterized by the following steps

- fabricating said metallic substrate or said buffer layer system on said substrate to consist of or contain on or close to its surface a microstructure of longitudinally oriented, long grains with a high aspect ratio, and

- epitaxially growing said superconducting compound on said substrate or said buffer layer system so that a majority of the superconducting grains becomes also longitudinally oriented and exhibits a high aspect ratio $a = L_{par}/L_{per}$ exceeding 1.5.

For the reasons expressed above, neither Tanaka et al. nor Matsumoto et al. teach or suggest such features. Applicant respectfully requests withdrawal of the rejections.

III. CONCLUSION

Accordingly, all claims 41, 42, 44-48 and 50-59 are believed to be allowable and the application is believed to be in condition for allowance. A prompt action to such end is earnestly solicited.

Should the Examiner feel that a telephone interview would be helpful to facilitate favorable prosecution of the above-identified application, the Examiner is invited to contact the undersigned at the telephone number provided below.

Should a petition for an extension of time be necessary for the timely reply to the outstanding Office Action (or if such a petition has been made and an additional extension is necessary), petition is hereby made and the Commissioner is authorized to charge any fees (including additional claim fees) to Deposit Account No. 18-0988.

Respectfully submitted,

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